

REMARKS

Favorable reconsideration of the present application is respectfully requested.

Claim 1 has been amended to further recite that at least a portion of the periphery of the particular filter is spaced from the casing to define a space surrounding the filter and through which the exhaust gases can flow, wherein the concave of the recess extends through the space to reach the particular filter. The basis for this is clearly shown at 21 in the figures and is further discussed below.

Briefly, it is conventional to provide a particulate filter for exhaust emission control of an engine. For example, U.S. patent 4,217,757 (Crone) discloses a filter 11 connected to receive exhaust gases from the exhaust pipe 18 of a diesel engine. The exhaust pipe 18 may additionally have a separate sound muffler, but this is not required (col. 2, lines 64-66).

The filter 11 is connected in line to the exhaust pipe 18 and comprises a case supporting internal perforate transverse panels 24 and 26 which limit a bed 19 of metallic mesh that is capable of trapping particulates. Therefore, exhaust gases flowing through the exhaust pipe 18 will pass through the mesh bed 19 so that particulates therein are trapped (Figure 2).

Crone also provides exhaust gas recirculation through the particulate filter in order to control the rate of carbon burning within the filter bed. To this end, one or more temperature sensors 36 extend through the wall of the filter and into the bed 19, and provide an input to circuitry that controls vents for the exhaust gas recirculation.

A more difficult problem arises, however, when a sound muffler is present and the particulate filter is housed within the casing of the sound muffler. In such a case, if the particulate filter is spaced from the muffler casing to create a surrounding space through which exhaust gases can flow to muffle sound, gaining access to the particulate filter in order to measure the temperature at the filter is hindered by the presence of the surrounding casing

and space for exhaust gas. It has therefore been known to instead measure the temperature of the exhaust gas in the sound muffling space surrounding the particulate filter as a substitute for that of the temperature at the filter (see present specification, page 3, paragraph [0007]). However, in this case the temperature at the particulate filter may not be accurately detected, and so control processes which require accurate detection of the particulate filter temperature, such as for particulate burning, cannot be accurately controlled.

According to a feature of the invention set forth in the claims, the muffler casing includes a recess which extends through the surrounding space to reach the particulate filter itself, and the temperature sensor is arranged to penetrate the deepest portion of the recess. An example of this is shown in Figures 3-4, wherein the recess 21 penetrates from the casing through the space surrounding the filter 8 to reach the filter 8, and the temperature sensor 22 penetrates the deepest portion of the recess 21 so that it can directly measure the temperature at the filter.

Claims 1 and 2 were rejected under 35 U.S.C. § 102 as being anticipated by Crone. It is respectfully submitted, however, that neither original Claims 1 and 2, nor the claims as presently amended, are anticipated by this reference.

As already explained, Crone does not disclose a particulate filter housed within a muffler, but instead simply discloses a filter attached in-line to an exhaust gas pipe which may or may not be provided with a separate muffler. Therefore, ready access to the filter is easily achieved, and the temperature sensor 36 may simply penetrate the filter housing. Accordingly, with respect to the originally presented Claim 1, Crone fails to teach “a particulate filter stored in a muffler.” It also fails to teach a muffler casing having a recess which is concave to a position in proximity to the particulate filter, and that the temperature sensor is arranged to penetrate the recess.

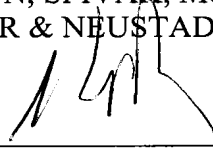
Applicants suppose, however, that Crone has been interpreted such that the particulate filter is limited to the particulate trapping bed 19 and the spaces within the filter housing 11 at locations upstream and downstream of the partition plates 24 and 26 are considered to be a “muffler.” Additionally, Applicants suppose that the unnumbered housing attached externally to the bottom of the filter at the same location as the temperature sensor 36 (as seen in Figure 2) has been interpreted to be a “recess” if viewed from within the filter housing. Even assuming this to be the case, however, amended Claim 1 clearly defines over Crone.

That is, Claim 1 now further recites that at least a portion of the periphery of the particulate filter is spaced from the casing to define a space in the casing, surrounding the particulate filter, through which the exhaust gases can flow, and that a recess at a temperature detecting area at the casing creates a concave extending through the space surrounding the particulate filter to reach the particulate filter itself. Assuming that the spaces at the upstream and downstream ends of the partition plates 24 and 26 in the filter casing of Crone are considered to be the muffler casing, and that the external housing projecting from the filter at the location of the temperature sensor 36 is considered to be a recess or concave, this “recess” or “concave” does not extend through the “space” surrounding the particulate filter through which the exhaust gases can flow, as is now claimed. Therefore, the amended claims are believe to define over any such interpretation of Crone.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early notice of allowability.

Respectfully submitted,

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